

**In The United States Patent and Trademark Office  
On Appeal From The Examiner To The Board  
of Patent Appeals and Interferences**

In re Application of: Seemant (nmi) Choudhary et al.  
Serial No.: 10/052,886  
Filing Date: January 18, 2002  
Group Art Unit: 2633  
Confirmation No.: 1721  
Examiner: Agustin Bello  
Title: **SYSTEM AND METHOD FOR MULTI-LEVEL PHASE  
MODULATED COMMUNICATION**

**Mail Stop - Appeal Brief - Patents**  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Dear Sir:

**Appeal Brief**

Appellants have appealed to the Board of Patent Appeals and Interferences from the Final Office Action sent electronically on July 14, 2009. Appellants filed a Notice of Appeal on October 14, 2009 and respectfully submit this Appeal Brief with the statutory fee of \$540.00.

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**Real Party In Interest**

This application is currently owned by Fujitsu Limited as indicated by an assignment recorded on December 7, 2005, in the Assignment Records of the United States Patent and Trademark Office at Reel 017099, Frame 0459.

**Related Appeals and Interferences**

There are no known appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision regarding this appeal.

**Status of Claims**

Claims 12, 14-17, 19, 37, 39-50, 52, and 55-57 are pending in this application. Claims 1-11, 13, 18, 20-36, 38, 51, 53, and 54 have been canceled. Claims 12, 14-17, 19, 37, 39-50, 52, and 55-57 were rejected under a Final Office Action electronically sent July 14, 2009. Claims 12, 14-17, 19, 37, 39-45, 49, and 50 were rejected by the Examiner under 35 U.S.C. § 102(e). Claims 46-48, 52, and 55-57 were rejected under 35 U.S.C. § 103(a). Appellants present Claims 12, 14-17, 19, 37, 39-50, 52, and 55-57 for appeal. Appendix A shows these claims involved in this appeal.

**Status of Amendments**

All amendments presented by the Appellants have been entered by the Examiner.

**Summary of Claimed Subject Matter**

For the convenience of the Board, Appellants provide the following mappings of the claims here on appeal. Appellants do not necessarily identify all portions of the specification and drawings relevant to the recited elements of the claims. Appellants provide the following mapping not to limit the scope of the claims, but to help the Board make a decision on this Appeal.

Independent Claim 12 of the present application recites a method for receiving a signal that includes generating a polarized local signal based on receiver-side feedback (as an example only and not by way of limitation, see Page 13, line 27 – Page 14, line 4; see Figure 6, components 70, 72 and 74) and combining an ingress traffic signal with the polarized local signal to generate a combined signal (as an example only and not by way of limitation, see Page 12, line 32 – Page 13, line 9; see Figure 6, component 62). The ingress traffic signal is compensated for polarization mode dispersion (as an example only and not by way of limitation, see Page 14, lines 5-10). In addition, the method includes splitting the combined signal into a first split signal and second split signal (as an example only and not by way of limitation, see Page 13, lines 10-22; see Figure 6, component 64), and detecting the first and second split signals (as an example only and not by way of limitation, see Page 13, lines 23-26; see Figure 6, component 66).

Independent Claim 37 of the present application recites a system for receiving a signal that includes a means for receiving a signal (as an example only and not by way of limitation, see Page 12, line 32 – Page 13, line 1; see Figure 6, component 62). The received signal is compensated for polarization mode dispersion (as an example only and not by way of limitation, see Page 14, lines 5-10). The system also includes a means for providing a local signal and a means for controlling a polarization of the local signal to generate an appropriately polarized local signal (as an example only and not by way of limitation, see Page 13, line 27 – Page 14, line 4; see Figure 6, components 72 and 74). Furthermore, the system includes a means for combining the polarized local signal and received signal (as an example only and not by way of limitation, see Page 13, lines 1-9; see Figure 6, component 62). The system also includes a means for splitting the combined signal into a first split signal and a second split signal (as an example only and not by way of limitation, see Page

13, lines 10-22; see Figure 6, component 64), and means for detecting the first and second split signals (as an example only and not by way of limitation, see Page 13, lines 23-26; see Figure 6, component 66). In addition, the system includes a means for generating feedback to modify the local signal (as an example only and not by way of limitation, see Page 13, line 27 – Page 14, line 4; see Figure 6, component 70).

Independent Claim 52 of the present application recites an optical receiver that includes a local oscillator that is optically coupled to a quarter wave plate and that is operable to generate an optical signal, where the quarter wave plate is optically coupled to a first beam splitter and is operable to receive an optical signal, circularly polarize the optical signal to generate a circularly polarized signal, and transmit the polarized signal to the first beam splitter (as an example only and not by way of limitation, see Page 13, line 27 – Page 14, line 4; see Figure 6, components 70, 72 and 74). Furthermore, the first beam splitter is optically coupled to a second polarization beam splitter and is operable to receive an optical traffic signal, combine the optical traffic signal with the circularly polarized signal to generate a combined signal, and transmit the combined signal to the second polarization beam splitter (as an example only and not by way of limitation, see Page 12, line 32 – Page 13, line 9; see Figure 6, components 62 and 24). The optical traffic signal is compensated for polarization mode dispersion (as an example only and not by way of limitation, see Page 14, lines 5-10). In addition, the second polarization beam splitter is optically coupled to a first photodiode and a second photodiode and is operable to receive the combined signal, split the combined signal into a first split signal and a second split signal, and transmit the first split signal to the first photodiode and the second split signal to the second photodiode (as an example only and not by way of limitation, see Page 13, lines 10-22; see Figure 6, components 64 and 24). Moreover, the first and second photodiodes are coupled to a decision circuit and are operable to receive the first and second split signals (respectively), generate first and second data signals (respectively) based on the first and second split signals (respectively), and transmit the first and second data signals (respectively) to the decision circuit (as an example only and not by way of limitation, see Page 13, lines 23-26; see Figure 6, components 66 and 67). The decision circuit is coupled to a feedback control module and is operable to determine a desired optical signal generated by the local oscillator generate a control signal based on the desired optical signal, and transmit the control signal to the feedback control module (as an



example only and not by way of limitation, see Page 13, lines 23-26; see Figure 6, component 68). The feedback control module is coupled to the local oscillator and is operable to generate an oscillator control signal based on the control signal (as an example only and not by way of limitation, see Page 13, line 27 – Page 14, line 4; see Figure 6, component 70), and the local oscillator is operable to receive the oscillator control signal and modify the optical signal based on the oscillator control signal (as an example only and not by way of limitation, see Page 13, line 27 – Page 14, line 4; see Figure 6, component 72).

**Grounds of Rejection to be Reviewed on Appeal**

Appellants request that the Board review the Examiner's rejection of Claims 12, 14-17, 19, 37, 39-45, 49, and 50 under 35 U.S.C. §102(e) as being anticipated by U.S. Patent 7,224,906 issued to Pak Shing Cho et al. ("*Cho*"); Claims 46-48 and 52 under 35 U.S.C. §103(a) as being unpatentable over *Cho*; and Claims 55-57 under 35 U.S.C. §103(a) as being unpatentable over *Cho* in view of U.S. Patent No. 7,136,588 issued to Mohammad N. Islam et al. ("*Islam*").

**Argument**

**I. The Examiner's Rejection of Claims 12, 14-17, 19, 37, 39-45, 49, and 50 Under Section 102(e) is Improper**

Claims 12, 14-17, 19, 37, 39-45, 49, and 50 were rejected by the Examiner under 35 U.S.C. §102(e) as being anticipated by U.S. Patent 7,224,906 issued to Pak Shing Cho et al. ("*Cho*"). Appellants contend that this rejection is improper for the reasons provided below.

First, Appellants respectfully traverse this rejection on the ground that *Cho* is not prior art. *Cho* was filed on February 28, 2002. The present application was filed January 18, 2002, before the filing date of *Cho*. Furthermore, although *Cho* includes priority claims to earlier-filed applications as a continuation-in-part application, the subject matter of *Cho* relied upon by the Office Action to reject the claims of the present application (e.g., Figure 24) does not appear to be included in any of these earlier-filed applications and the Office Action has not provided any showing of a similar disclosure in the earlier-filed applications. As such, *Cho* is not prior art to the present application under 35 U.S.C. § 102(e) or under any other provision of the patent laws.

In the Advisory Action, the Examiner indicates that *Cho* is prior art at least based on the support for its disclosure found in Figure 7a of U.S. Patent No. 7,111,677, to which *Cho* claims priority as a continuation-in-part. However, Figure 7a of U.S. Patent No. 7,111,677 does not disclose the generation of a polarized local signal as disclosed in Figure 24 of *Cho*. This disclosure of a polarized local signal of *Cho*, which is not found in U.S. Patent No. 7,111,677, is used by the Examiner to teach the claim limitations "generating a polarized local signal based on receiver-side feedback" and "combining the ingress traffic signal including the first signal and the second signal with the polarized local signal to generate a combined signal." Because this disclosure of *Cho* is not found in U.S. Patent No. 7,111,677, it is not available as prior art to the present application and its use to teach the claimed limitations is improper.

For at least this reason, Appellants respectfully request allowance of all pending claims, which are all rejected in light of *Cho*.

Furthermore, regardless of its status as prior art, *Cho* does not disclose each and every limitation of the claims of the present application. “A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987). Furthermore, “the identical invention must be shown in as complete detail as is contained in the ... claim.” *Richardson v. Suzuki Motor Co. Ltd.*, 868 F.2d 1226, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989). Furthermore, “[t]o establish inherency, the extrinsic evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.” M.P.E.P. § 2112; *See In re Robertson*, 49 U.S.P.Q.2d 1949, 1150-51 (Fed. Cir. 1999). “In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art.” M.P.E.P. § 2112; *Ex parte Levy*, 17 U.S.P.Q. 1461, 1464 (Bd. Pat. App. & Inter. 1990).

Independent Claim 12 of the present application recites the following limitations:

A method for receiving a signal, comprising:  
generating a polarized local signal based on receiver-side feedback;  
receiving an ingress traffic signal comprising a first signal and a second signal, the first and second signals having the same wavelength, having different polarizations, and being modulated based on different data;  
combining the ingress traffic signal including the first signal and the second signal with the polarized local signal to generate a combined signal;  
splitting the combined signal into a first split signal and second split signal using a polarization beam splitter;  
detecting the first split signal;

detecting the second split signal; and  
converting the detected first split signal and second split signal into  
intended data streams.

Independent Claim 37 recites similar, although not identical, limitations.

*Cho* does not disclose each and every one of these limitations. For example, *Cho* does not disclose “receiving an ingress traffic signal comprising a first signal and a second signal, the first and second signals having the same wavelength, having different polarizations, and being modulated based on different data.” For a teaching of this limitation, the Office Action refers to the signal generated by the transmitter 1800 of Figure 8 of *Cho*; however, this figure simply shows and describes a QPSK optical signal transmitter. There is no disclosure of the generation of two signals of the same wavelength having different polarizations.

In addition, *Cho* does not disclose “splitting the combined signal into a first split signal and second split signal using a polarization beam splitter.” For a teaching of this limitation, the Office Action refers to hybrid 302’ of Figure 24 and asserts that this limitation is inherent in hybrid 302’. However, there is no disclosure that the hybrid performs polarization beam splitting. *Cho* only discloses that the hybrid outputs four signals having different phases. There is no disclosure that any polarization splitting is possible with hybrid, much less that it is necessarily present. As noted above, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art. Such a showing has not and cannot be provided based on the disclosure of *Cho*.

For at least these additional reasons (in addition to *Cho* not being prior art), Appellants respectfully request allowance of Claim 12, as well as the claims that depend from Claim 12. In addition, independent Claim 37 includes similar, although not identical limitations, and is allowable for similar reasons. Thus, Appellants also respectfully request allowance of Claim 37, as well as the claims that depend from Claim 37.

**II. The Examiner's Rejection of Claims 46-48, 52, and 55-57 Under Section 103(a) is Improper**

Claims 46-48 and 52 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Cho*. Claims 55-57 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Cho* in view of U.S. Patent No. 7,136,588 issued to Mohammad N. Islam et al. ("*Islam*").

Dependent Claims 46-48 depend from Claim 37, which is allowable for the reasons provided above. Independent Claim 52 (and thus its dependent Claims 55-57) recites similar, although not identical, limitations as Claims 12 and 37 discussed above. Thus, for the same reasons discussed above with respect to Claims 12 and 37, Appellants respectfully request allowance of Claims 46-48, 52, and 55-57.

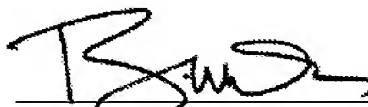
**Conclusion**

Appellants have demonstrated that the present invention, as claimed, is clearly distinguishable over the prior art cited by the Examiner. Therefore, Appellants respectfully request the Board of Patent Appeals and Interferences to reverse the final rejection of the Examiner and instruct the Examiner to issue a notice of allowance of all claims.

Please charge a fee in amount of \$540.00 to cover the filing fee for this Appeal Brief to Deposit Account No. 50-2148 of BAKER BOTTS L.L.P. The Commissioner is also authorized to charge any other fees or credit any overpayments to Deposit Account No. 05-2148 of BAKER BOTTS L.L.P.

Respectfully submitted,

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**Appendix A: Claims on Appeal**

1-11. (Canceled)

12. (Previously Presented) A method for receiving a signal, comprising:  
generating a polarized local signal based on receiver-side feedback;  
receiving an ingress traffic signal comprising a first signal and a second signal, the first and second signals having the same wavelength, having different polarizations, and being modulated based on different data;  
combining the ingress traffic signal including the first signal and the second signal with the polarized local signal to generate a combined signal;  
splitting the combined signal into a first split signal and second split signal using a polarization beam splitter;  
detecting the first split signal;  
detecting the second split signal; and  
converting the detected first split signal and second split signal into intended data streams.

13. (Canceled)

14. (Original) The method of Claim 12, wherein the polarization is circular.

15. (Original) The method of Claim 12, wherein the first split signal comprises a first component of the received signal.

16. (Original) The method of Claim 12, wherein the second split signal comprises a second component of the received signal.

17. (Original) The method of Claim 12, wherein the ingress traffic signal is optical.

18. (Canceled)



19. (Previously Presented) The method of Claim 12, wherein the polarization of a first component of the ingress traffic signal is aligned to an axis of the polarization beam splitter.

20-36. (Canceled)

37. (Previously Presented) A system for receiving a signal comprising:

- a means for receiving a signal comprising a first signal and a second signal, the first and second signals having the same wavelength, having different polarizations, and being modulated based on different data;
- a means for providing a local signal;
- a means for controlling a polarization of the local signal to generate an appropriately polarized local signal;
- a means for combining the polarized local signal and the received signal;
- a polarization beam splitter for splitting the combined signal into a first split signal and a second split signal;
- a means for detecting the first split signal;
- a means for detecting the second split signal;
- a means for converting the detected first split signal and second split signal into intended data streams; and
- a means for generating feedback to modify the local signal.

38. (Canceled)

39. (Original) The system of Claim 37, wherein the signal is received by an automatic polarization controller.

40. (Original) The system of Claim 37, wherein the appropriate polarization of the local signal is circular.

41. (Original) The system of Claim 37, wherein the first split signal comprises a first component of the received signal.

42. (Original) The system of Claim 37, wherein the second split signal comprises an orthogonally polarized second component of the received signal.

43. (Original) The system of Claim 37, wherein the signal is optical.

44. (Original) The system of Claim 37, wherein the local signal is provided by a continuous wave laser.

45. (Original) The system of Claim 37, wherein the local signal means yields circularly polarized light.

46. (Original) The system of Claim 37, wherein the means to control polarization is a quarter wave plate.

47. (Original) The system of Claim 37, wherein the combiner means is a 3 decibel splitter.

48. (Original) The system of Claim 37, wherein the combiner means is a half mirror.

49. (Previously Presented) The method of Claim 37, wherein a first component of the signal is aligned to an axis of the polarization beam splitter.

50. (Original) The system of Claim 37, wherein the detecting means is a photodiode.

51. (Canceled)

52. (Previously Presented) An optical receiver, comprising:

a local oscillator optically coupled to a quarter wave plate and operable to generate an optical signal;

the quarter wave plate optically coupled to a first beam splitter and operable to receive the optical signal, circularly polarize the optical signal to generate a circularly polarized signal, and transmit the polarized signal to the first beam splitter;

the first beam splitter optically coupled to a second polarization beam splitter and operable to receive an optical traffic signal, combine the optical traffic signal with the circularly polarized signal to generate a combined signal, and transmit the combined signal to the second polarization beam splitter, wherein the optical traffic signal comprises a first signal and a second signal, the first and second signals having the same wavelength, having different polarizations, and being modulated based on different data;

the second polarization beam splitter optically coupled to a first photodiode and a second photodiode and operable to receive the combined signal, split the combined signal into a first split signal and a second split signal, and transmit the first split signal to the first photodiode and the second split signal to the second photodiode;

the first photodiode coupled to a decision circuit and operable to receive the first split signal, generate a first data signal based on the first split signal, and transmit the first data signal to the decision circuit;

the second photodiode coupled to a decision circuit and operable to receive the second split signal, generate a second data signal based on the second split signal, and transmit the second data signal to the decision circuit;

the decision circuit coupled to a feedback control module and operable to determine a desired optical signal generated by the local oscillator generate a control signal based on the desired optical signal, and transmit the control signal to the feedback control module;

the feedback control module coupled to the local oscillator and operable to generate an oscillator control signal based on the control signal; and

the local oscillator operable to receive the oscillator control signal and modify the optical signal based on the oscillator control signal.

53. (Canceled)

54. (Canceled)

55. (Previously Presented) The method of Claim 12, further comprising compensating the ingress traffic signal for polarization mode dispersion.

56. (Previously Presented) The system of Claim 37, further comprising a means for compensating the received signal for polarization mode dispersion.

57. (Previously Presented) The optical receiver of Claim 52, further comprising a polarization mode dispersion compensator operable to receive an optical traffic signal and to compensate the optical traffic signal for polarization mode dispersion.

**Appendix B: Evidence**

**NONE**

**Appendix C: Related Proceedings**

**NONE**